

In Situ Proximity GAP Monitor for Lithography

Abstract

A method, and a system for implementing the method, for determining an exposure gap between a mask and a resist material, where the resist material is exposed to an incident energy transmitted through exposure regions of the mask. The method includes the steps of: providing first gratings on one or more sides of a first structure defined by one or more first regions of the mask; providing second gratings on one or more sides of a second structure defined by one or more second regions of the mask; exposing the first and the second structures to the incident energy; measuring a difference between a location in the first structure and a location in the second structure; and extrapolating the exposure gap from the difference. A mask writing tool is used to provide the first gratings and the second gratings. The step of providing the first gratings can include the step of: providing gratings on a pair of adjacent edges of an internal box structure defined by the one or more first regions. The step of providing the second gratings comprises the step of: providing gratings on a pair of adjacent edges of an external box structure defined by the one or more second regions located opposite from the pair of adjacent edges of the internal box structure. The step of providing the first gratings includes the step of: providing gratings on a pair of opposite edges of an internal box structure defined by the one or more first regions. Also, the step of providing the second gratings includes the step of: providing gratings on a first edge of the internal box structure and on a second edge of an external box structure defined by one of the second regions, the first and the second edge being located opposite from one another.